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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,312	01/02/2004	Josehp J. Schottler	P06708US0-6025	2007

34082 7590 09/10/2007

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DES MOINES, IA 50309-2350

EXAMINER	
CHANG, SUNRAY	

ART UNIT	PAPER NUMBER
2121	

MAIL DATE	DELIVERY MODE
09/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/751,312	SCHOTTLER ET AL.	
	Examiner	Art Unit	
	Sunray Chang	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in responsive to the paper filed on May 30th, 2007.

Claims 1 – 10 are presented for examination.

Claims 1 – 10 are rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. **Claims 1 – 4 and 7 – 10 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Joseph F. McCormick (U.S. Patent No. 5,012,722, and referred to as **McCormick** hereinafter), in view of Tracy et al. (U.S. Patent No. 7,247,955, and referred to as **Tracy** hereinafter).

(**McCormick** as set forth above generally discloses the basic inventions.)

Regarding independent claim 1, 8 and 9,

McCormick teaches,

- A method of driving the coil of an electrohydraulic valve [Abstract, Fig. 3] with a PWM drive [Fig. 3], [see further Col. 5, Lines 14 – 27 & Col. 4, Lines 49 – 64] comprising:
- Transmitting a feedback signal to a digitizing device that is electrically connected to the electrohydraulic valve; [Col. 7, Lines 12 – 39, Fig. 8 applying the selected signal to ADC via analog line]
- Transmitting the plurality of samples to an accumulator; [loop controller receives control information indicating a desired operation of the hydraulic valve through control input, and feedback information indicating the state of various elements in the servo loop, Col. 5, Lines 16 – 20]

McCormick does not point out clearly the "operate in a desired manner" is using "averaging, calculating the samples"

Tracy teaches, [in Col. 3 – Col.5]

- Averaging the plurality of samples within the accumulator to create an average value; [Fig. 6; the FIR filter may be a low pass averaging filter that averages the samples for several consecutive period, Col. 5, lines 24 – 45] and
- Transmitting the average value to a closed loop control algorithm that generates a pulse width signal to drive the coil of the electrohydraulic valve. [the filtered output of the FIR filter is converted to a space vector coordinate domain by a space vector conversion algorithm, Col. 5, lines 24 – 45; Fig. 6]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **McCormick** to include the teach of **Tracy**, "averaging, calculating the samples", for the purpose of developing new pulse width commands for the switch control signaling algorithm using feedback information from preceding sample period [Col. 5, lines 58 – 60]

Regarding dependent claims 2 – 4, McCormick teaches,

- The digitizing device is an A/D converter, a DSP or a micro controller. [microprocessor & ADC, Col. 7, Lines 12 – 39 & 47 – 61, Fig. 8]

2. **Claims 5 and 6 are rejected** under 35 U.S.C. 103(a) as being unpatentable over **McCormick**, in view of **Tracy** and further in view of Gary Bergstrom (U.S. Patent No. 6,249,418, and referred to as **Bergstrom** hereinafter).

(**McCormick** as set forth above generally discloses the basic inventions.)

Regarding dependent claims 5 and 6,

McCormick teaches algorithms [formula relationships or look up data tables, Col. 7, Lines 47 – 61].

McCormick does not teach PID or PI.

Bergstrom teaches PID [standard closed loop controller design methods … PID, Col. 9, Lines 63 – 65], for the purpose of generating the required force. [Col. 9, Lines 66 – 67]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **McCormick** to include the teach of **Bergstrom**, "PID", for the purpose of generating the required force. [Col. 9, Lines 66 – 67]

3. **Claim 7 is rejected** under 35 U.S.C. 103(a) as being unpatentable over **McCormick** in view of **Tracy** and further in view of Hiroshi Shimamori (U.S. Patent No. 6,204,650, and referred to as **Shimamori** hereinafter).

McCormick teaches,

- A method of driving the coil of an electrohydraulic valve [Abstract, Fig. 3] with a PWM drive [Fig. 3], [see further Col. 5, Lines 14 – 27 & Col. 4, Lines 49 – 64] comprising:

Tracy teaches, [in Col. 3 – Col.5]

- Averaging the plurality of samples within the accumulator to create an average value; [Fig. 6; the FIR filter may be a low pass averaging filter that averages the samples for several consecutive period, Col. 5, lines 24 – 45] and

Shimamori teaches,

- The accumulatoe resets. [`initialization` includes the initialization of each type of register, the setting of a timer (setting the sampling cycle shown in FIG. 18), the setting of an interrupting process, the setting of the PWM unit 11, etc. The setting of the PWM unit 11 includes a process of writing a predetermined value to the cycle register 61, and a process of resetting the ON-time register, Col. 14, Lines 19 – 27] for the purpose of initialization of each type of register, Col. 14, lines 19 – 27]

Response to Amendment

Claim Rejections - 35 USC § 103

4. Applicants' arguments regarding the motivation to combine the references cited in preceding office action is disagreed, yet, newly cited reference **Tracy** has been cited to be combined with **McCormick**'s teaching to replace the combination of the preceding rejections for exactly indicating the claimed limitations.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunray Chang who may be reached Monday through Friday, between 8:00 a.m. and 5:00 p.m. EST. via telephone number (571) 272-3682 or facsimile transmission (571) 273-3682 or email sunray.chang@uspto.gov.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687.

The official facsimile transmission number for the organization where this application or proceeding is assigned is (571) 273-8300.

Anthony Knight
Supervisory Primary Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

September 2, 2007